IHS CHEMICAL

SBR Process Summary

Process Economics Program Review 2017-11

February 2017 ihs.com

PEP Review 2017-11

SBR Process Summary

Girish Ballal
Principal Analyst

PEP Review 2017-11

SBR Process Summary

Girish Ballal, Principal Analyst

Abstract

Styrene-butadiene rubber (SBR) is currently the largest-volume elastomer produced on a global basis. It is used mostly in the production of automobile tires, but also in the production of industrial goods such as belts and hoses. The largest end use of styrene-butadiene rubber is in production of automobile tires. Other uses of SBR include industrial goods such as conveyer belts, industrial hoses, and gaskets, as well as consumer goods such as footwear. There are two classes of production processes for SBR. Emulsion polymerization is the original process and still the dominant process in the industry. However, the solution polymerization process has emerged as the preferred process of choice. Global SBR demands by the emulsion and solution polymerization processes are expected to grow at annual rates of 3.1% and 4.4%, respectively, in the near future.

In this Process Economics Program (PEP) process summary, we review the current technologies for industrial production of styrene-butadiene rubber. Almost 76% of SBR is currently produced by the emulsion process, versus 24% by the solution polymerization process. The solution polymerization process results in better quality product with more flexibility in tailoring the properties relevant to “green tires” (longer-lasting tires that allow higher gas mileage). The technologies presented here are based on previous PEP reports and reviews on this subject and are consolidated for a convenient overview. Moreover, a brief summary of SBR supply and demand is presented, mostly on the global basis. Historical price movement in the product and the feedstock is presented along with a summary of underlying market drivers.

The production economics assessment in this review is based on a US Gulf Coast (USGC) location. However, an iPEP Navigator module is attached to the electronic version of this process summary to allow a quick conversion of snapshot process economics to three other major regions—Germany, Japan, and China. With the selection of each competing process, the module also allows production economics to be reported in English or metric units for each region.

Moreover, due to the fluctuation and variation of feedstock and utility prices over time and in different regions, ranking of the processes by a snapshot comparison can be misleading. To overcome the deficiency of a traditional snapshot economics comparison, this process summary also includes an iPEP Spectra interactive data module, by which our clients can quickly compare historical quarterly production economics of competing processes in major global regions from 2000 through the second quarter of 2016. The interactive module, written as a Microsoft Excel pivot table, is also attached with the electronic version of this process summary. The module provides a powerful interactive tool to compare production economics at various levels, such as variable cost, cash cost, and full production cost. An iPEP Spectra module provides a more comprehensive way of assessing competing technologies, leading to a more valid investment decision.

While the processes herein are PEP’s independent interpretation of the companies’ patent literature and may not reflect in whole or in part the actual plant configuration, we do believe that they are sufficiently representative of the processes to estimate the plant economics within the range of accuracy for economic evaluations of the conceptual process designs.

Contents

Tables

Figures

IHS Customer Care:

Americas: +1 800 IHS CARE (+1 800 447 2273); CustomerCare@ihs.com
Europe, Middle East, and Africa: +44 (0) 1344 328 300; Customer.Support@ihs.com
Asia and the Pacific Rim: +604 291 3600; SupportAPAC@ihs.com